Safeguarding California: Preparing for Climate Risks

an update to the
2009 California Climate Adaptation Strategy

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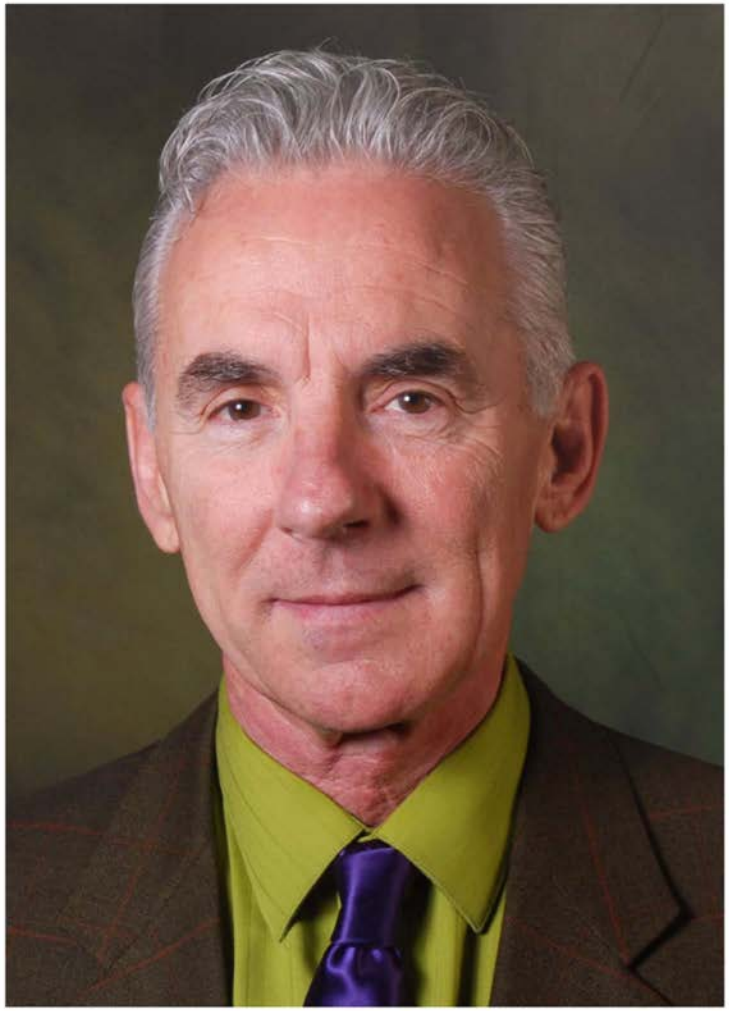
Public Workshop & Listening Session

CALIFORNIA natural resources AGENCY



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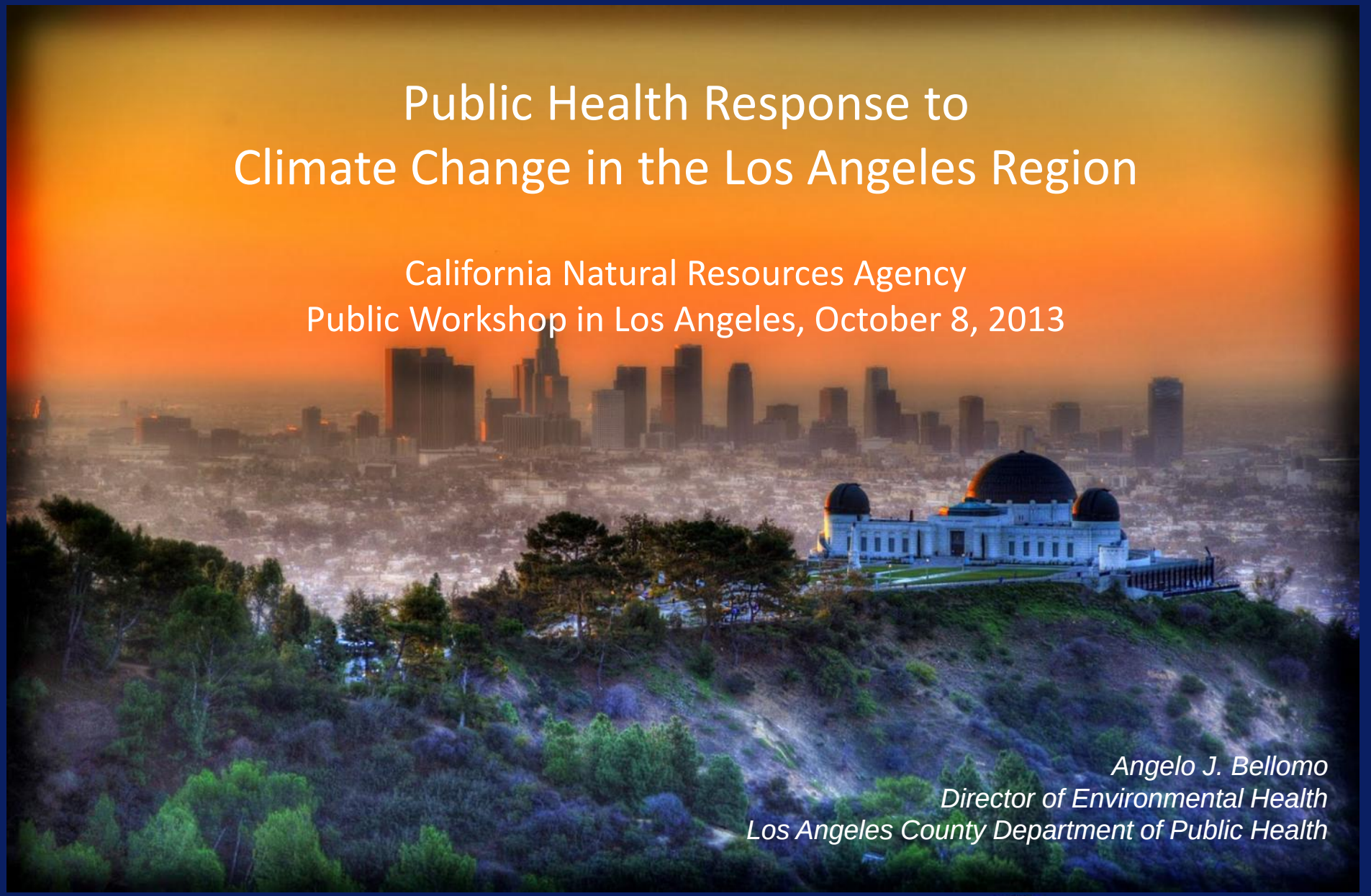
Public Health Response to Climate Change in the Los Angeles Region

California Natural Resources Agency
Public Workshop in Los Angeles, October 8, 2013



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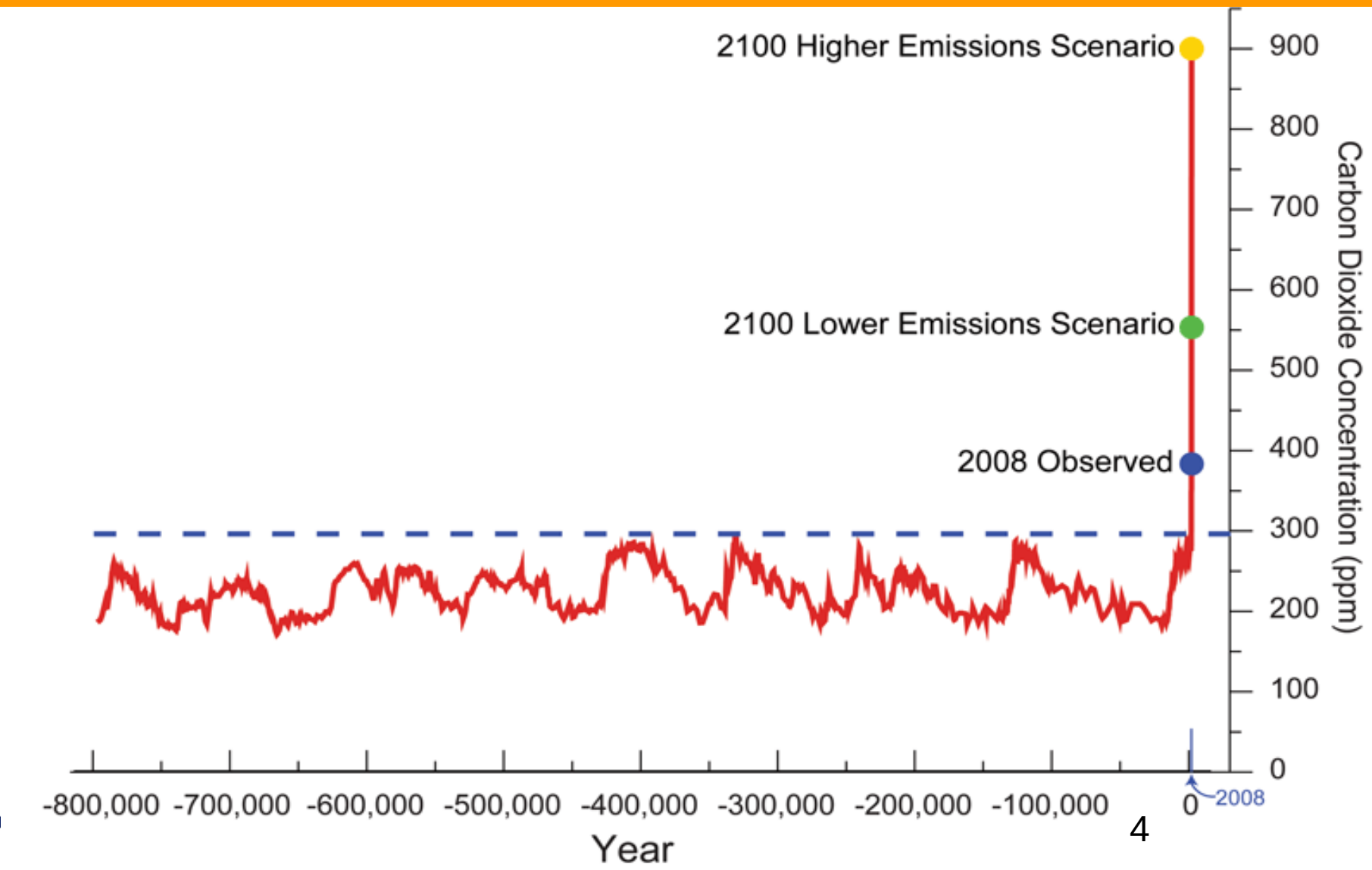
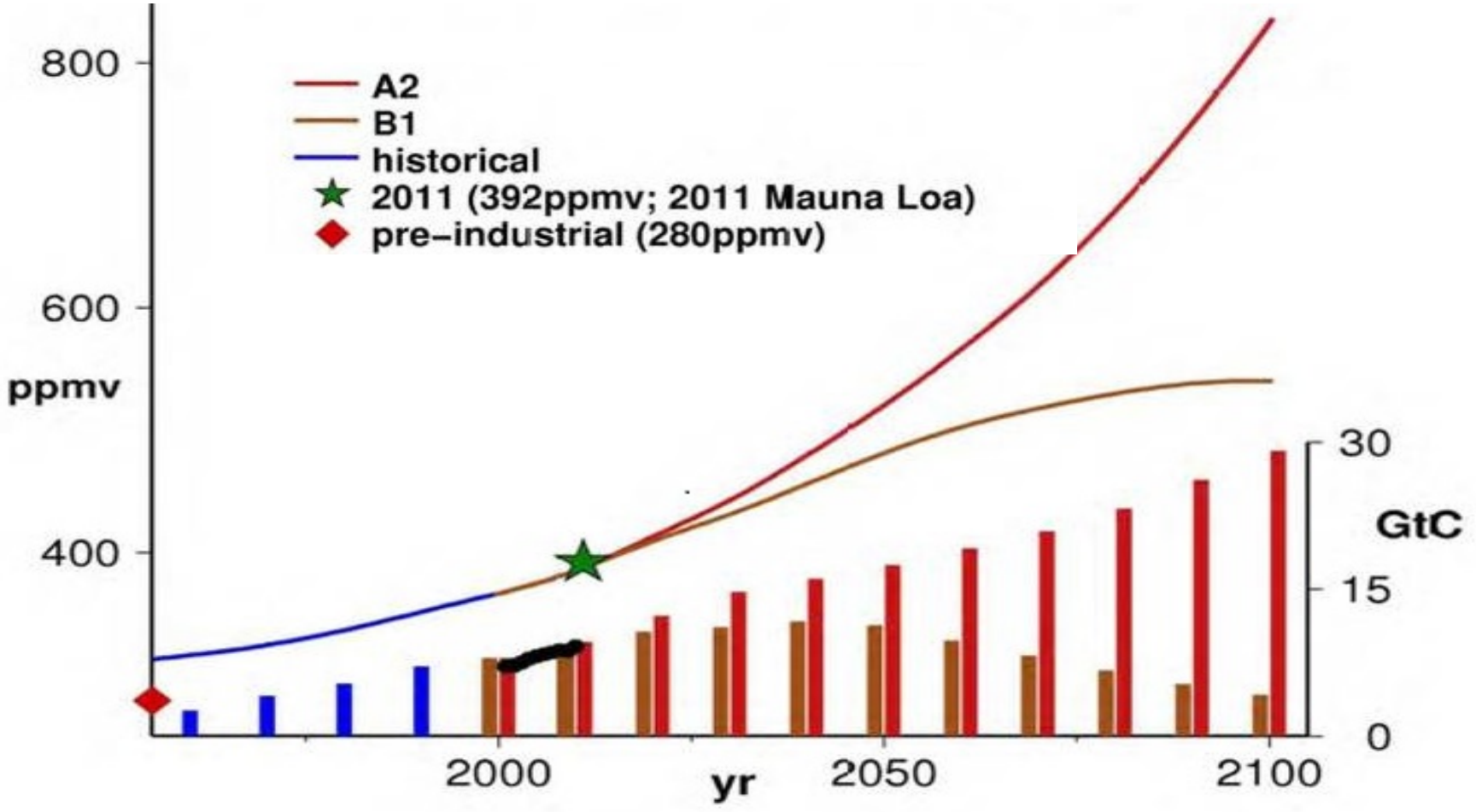
County of Los Angeles Public Health

Historic Variation of Carbon Dioxide Levels in the Atmosphere

(Source: *Global Climate Change Impacts in the United States*, 2009. U.S. Global Change Research Program)



Observed and Projected Carbon Emissions (GtC) and CO_2 Concentrations (ppmv)



[1]Climate Change and Sea Level Rise Scenarios for California Vulnerability and Adaptation Assessment, California Energy Commission's California Climate Change Center, 2012

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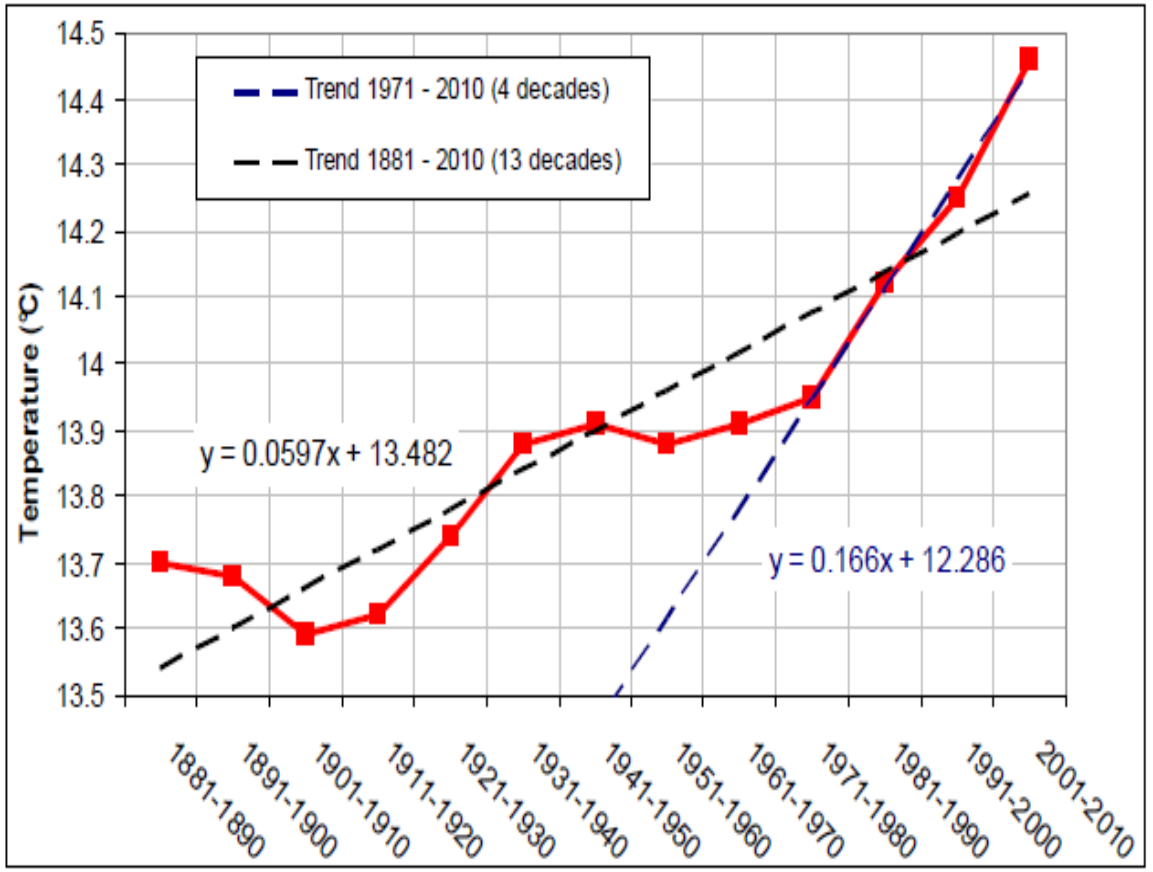
Changes in Global Temperatures[1]

- 2011 was 11th warmest year since 1850; warmest decade was 2001-2010
- Since 1881, global temps have increased an average 0.06°C per decade
- Since 1971, the rate has averaged 0.17°C per decade.



[1]IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis.

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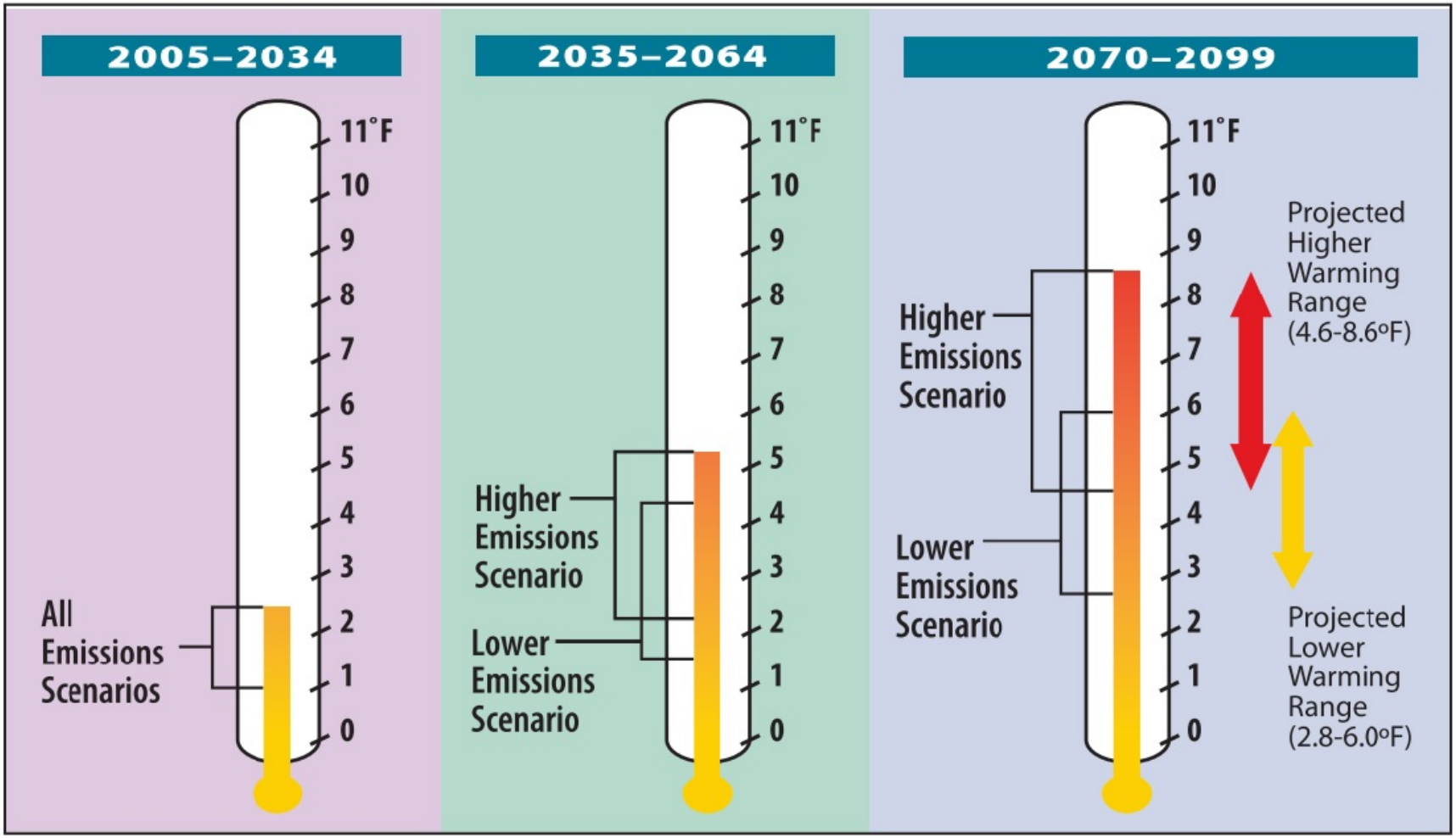
California Projected Increases in Annual Temperatures for three 30-year Periods[1]



[1]Our Changing Climate 2012, Summary Report on the Third Assessment from the California Climate Change Center, 2012

Projected Warming in Los Angeles Region

- UCLA Projections for LA Region[1]
  - Downscaling of "global models" / finer resolution
  - Projections are for mid-century
  - Average temps to warm 4.5 to 5 F
    - Oceans / coastal areas — 3.5 to 4
    - LA Basin — about 4
    - SF Valley — slightly above 4
    - Lancaster / Palmdale — about 5
    - SG and SB Mountains — 5+
- California warming projected at 2.7 – 5 °F by 2050 (and 4 – 9 °F by 2100)[2]

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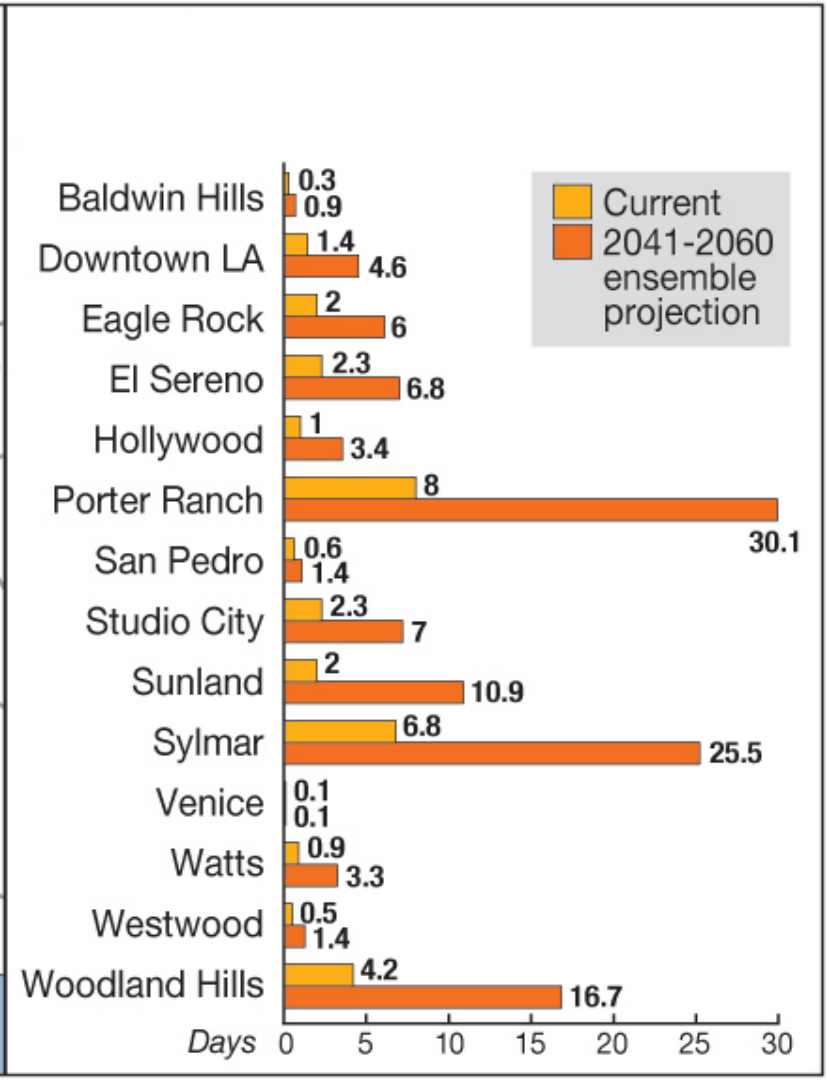
[1]Mid-Century Warming in the Los Angeles Region, UCLA, 2012
[2]California Climate Adaptation Strategy, California Natural Resources Agency, 2009

Current and Projected Temperature Extremes in LA Area

Average Annual Days Exceeding 95 °F



Source: UCLA LARC study, 2012; chart based on the mean/average projected by the 19 climate models

Climate Change in California

Temperature increases of 2 – 5 F by 2050, and 4 – 9 by 2100

Sea level rise of 12 - 18 inches by 2050; 21 - 55 inches by 2100

Winter snow reduction across the State

Increased precipitation & flooding

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Source: California Natural Resources Agency. *2009 California Climate Adaptation Strategy.*

Effects of Increasing CO_2 Levels in the Atmosphere

Physical Effects		Health Effects
Primary	Secondary	
• Increased Temps • Sea Level Rise • Severe Weather	• Heat waves • Air pollution • Wildfires • Flooding • Infrastructure Damage • Water pollution • Drought	• Heat-related death & illness • Respiratory / cardiovascular disease • Water- and food-borne disease • Vector- borne disease • Cancer • Weather-related injury & death • Anxiety, depression

(A J Bellomo, March 2013)

Heat Waves & Mortality

"Heat waves" cause average 1000 deaths each year in U.S. and 165 in LA County

Europe (2003): 70,000 deaths; Russia (2010): 11,000 – 50,000

Chicago (1995): 750 deaths; California (2006): 655 deaths

Heat-related deaths in U.K. estimated to grow by 260% in 2050s, and 540% in 2080s

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Source: California Department of Public Health, *Preparing California for Extreme Heat: Guidance and Recommendations, 2013*

Effects of Warming on Air Quality

- Increased levels of ground-level ozone
- Longer season for allergen-producing weeds
- More wildfires fueled by higher winds and hotter / longer summers
- Increased levels of particulate matter

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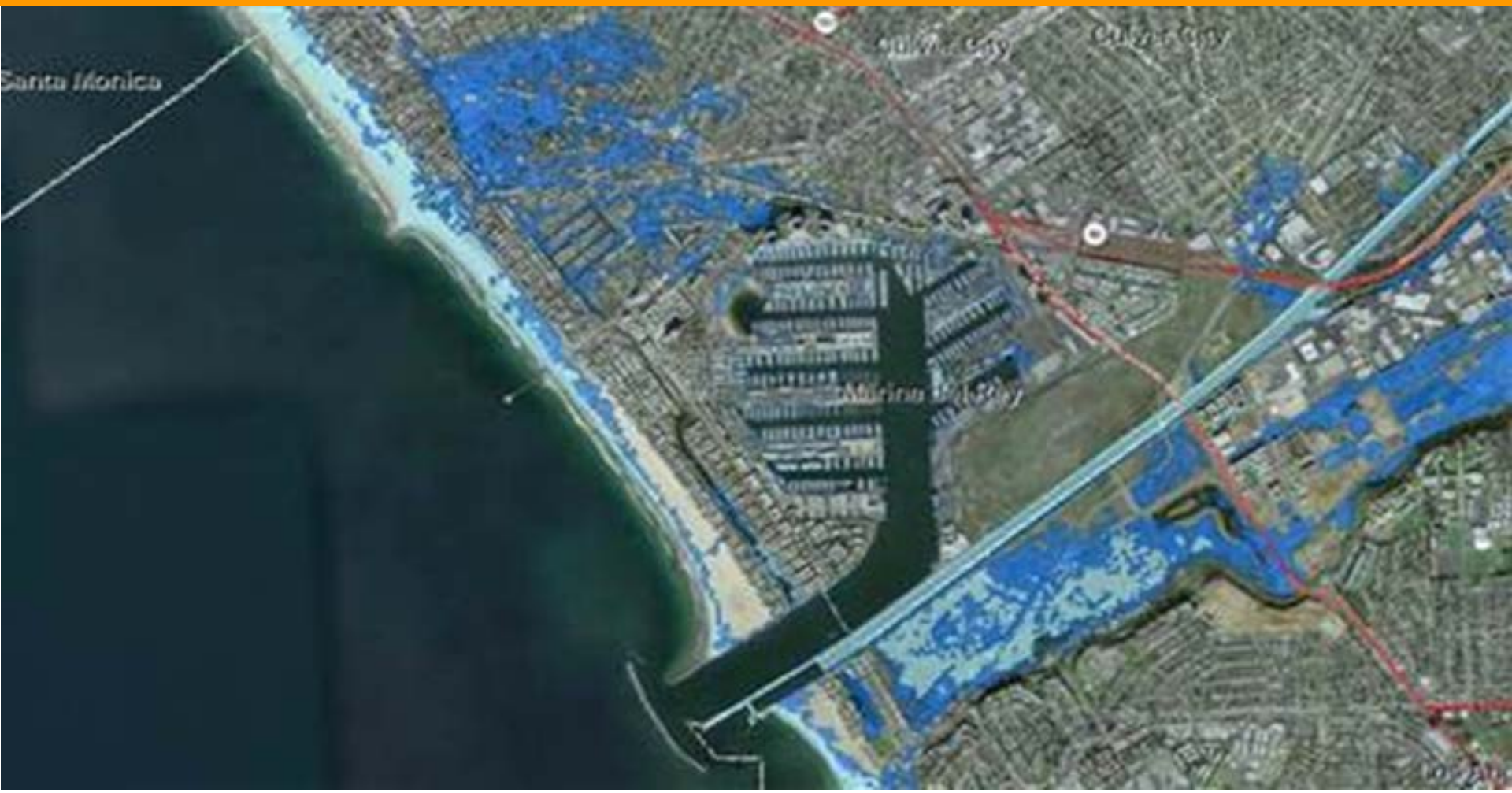
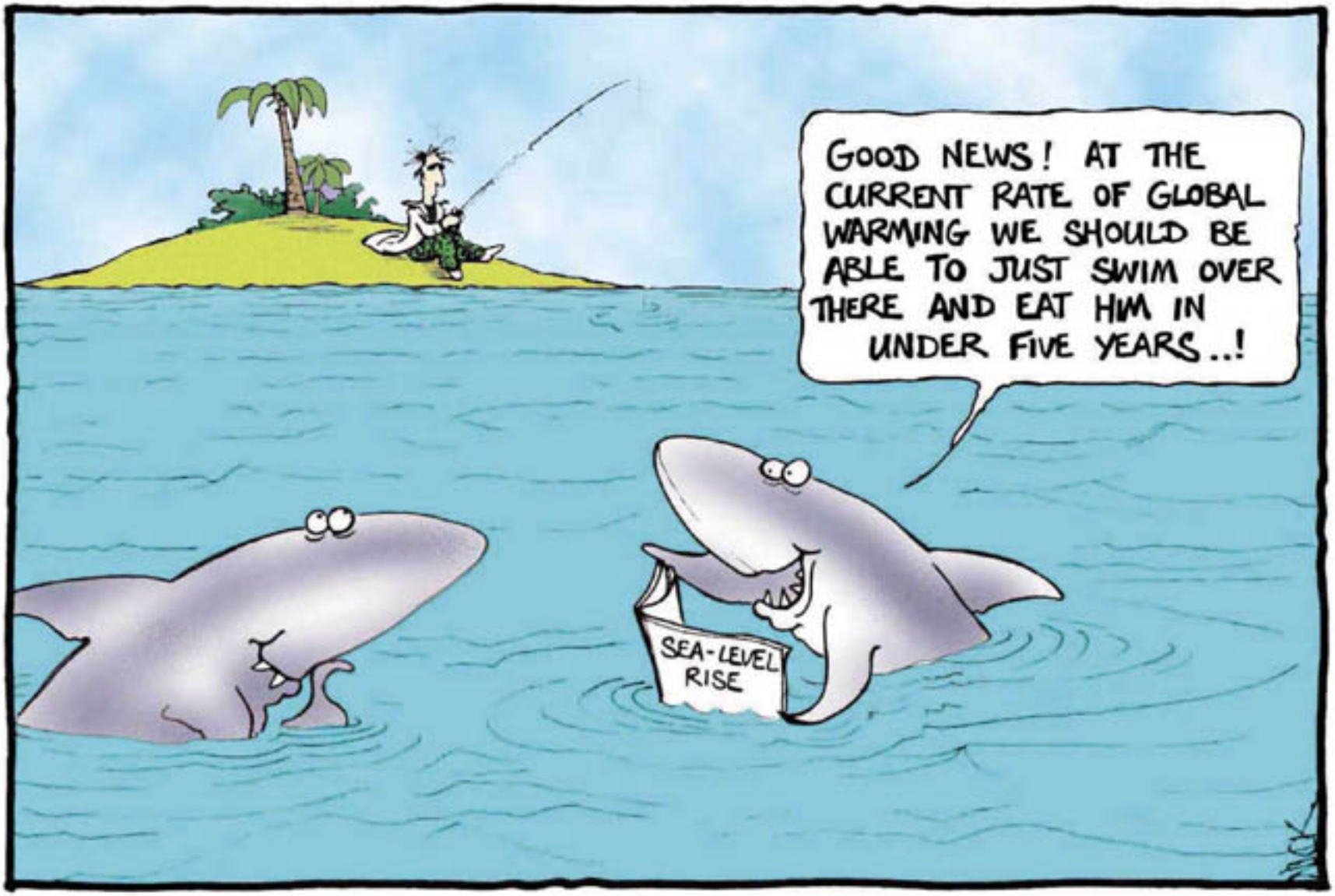
Source: California Natural Resources Agency, *2009 California Climate Adaptation Strategy.*

Projected Sea Level Rise - LA Coastline
(2050 - 2100)



(Photo credit: Pacific Institute. Coast along Venice Beach and Marina Del Rey: Dark blue marks flooded area if sea level rises by 5 feet)


GOOD NEWS! AT THE CURRENT RATE OF GLOBAL WARMING WE SHOULD BE ABLE TO JUST SWIM OVER THERE AND EAT HIM IN UNDER FIVE YEARS..!
SEA-LEVEL RISE

Extreme Weather Events – Heavy Storms & Flooding

Potential Impacts:

- Injuries & deaths
- Destruction of housing
- Damage to public infrastructure
- Discharges of sewage & industrial chemicals
- Contamination of drinking water supplies
- Disruption of food supplies

Damage to Infrastructure

In the absence of adequate housing, potable water and food:

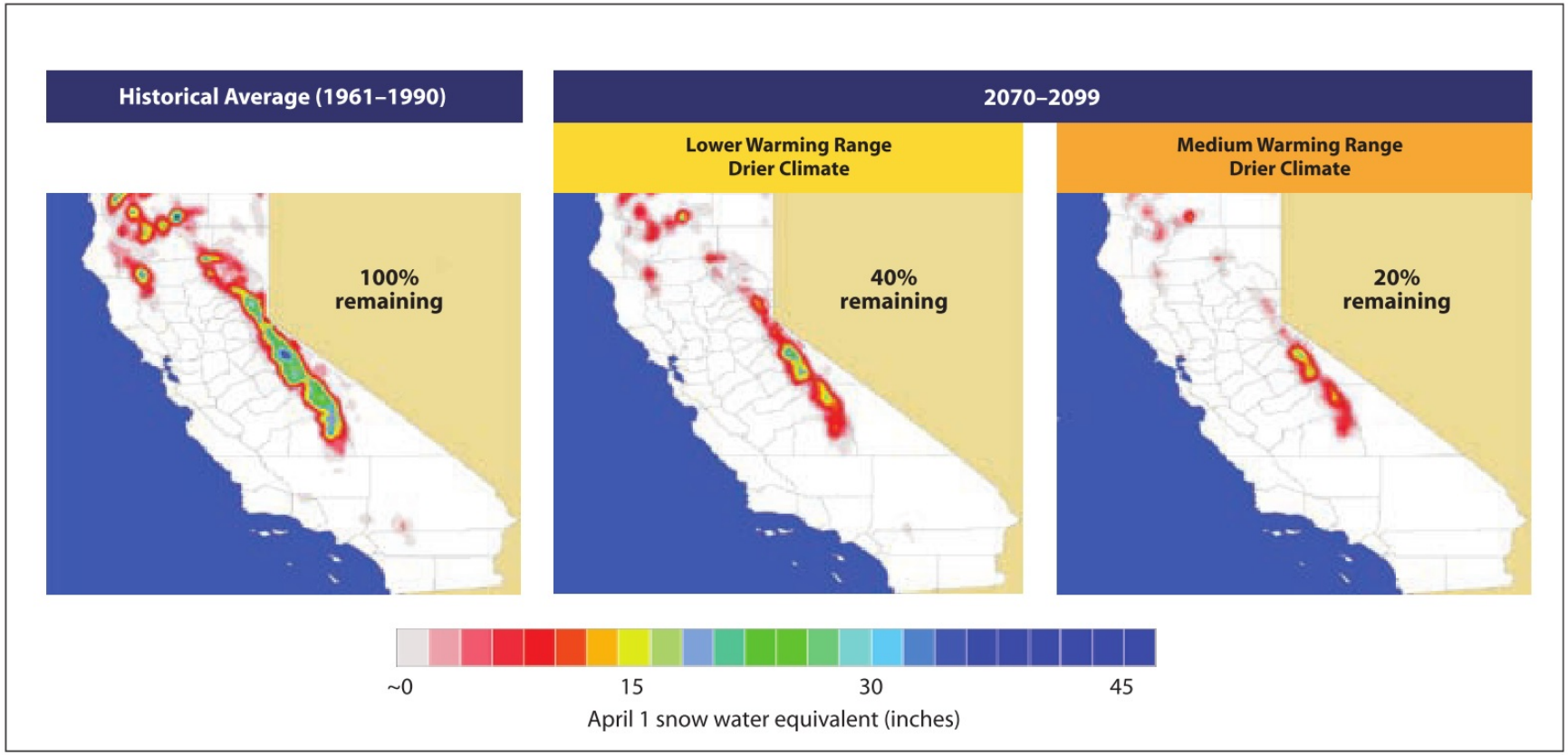
- Cannot provide for basic sanitation
- Unable to maintain health
- Population prone to malnutrition, poverty, migration

Extreme Weather Events – Drought

- NOAA reports > 40 % of the continental U.S. in a moderate or worse drought; and > 30 percent in a severe or worse drought[1]
- Lakes Powell & Meade + Colorado River supply water to 40 million people in 7 western states
- Both reservoirs less than half full

[1] Weekly Drought Monitor, NOAA, July 30, 2013

Decreased California Snowpack



[1]Our Changing Climate Assessing the Risk to California, California Climate Change Center, 2006

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Increases in Vector-borne Diseases

- West Nile Virus 2012: >150 human cases in California (3150 in U.S.)

- VBDs highly sensitive to temp, rainfall & humidity

- Plague, murine typhus and hantavirus are all endemic in California; PH significance likely to grow

- Greater potential for RMSF, dengue, and tick-borne Lyme disease *(all relatively rare)*

Increases in Food-borne Diseases

- Warmer environments = increased potential for salmonella and other foodborne illness
- Certain algal blooms (“red tides”) can contaminate shellfish and produce *paralytic shellfish poisoning*
- Warmer seawater also increases the multiplication of vibrio bacteria in shellfish

Local Response to Climate Change – Two Approaches

- Actions to reduce greenhouse gas emissions and mitigate extent of climate change

- Preparedness actions to lessen impacts on health

Actions to Reduce Carbon Emissions

- Energy efficiency
- Water Conservation
- Waste reduction, reuse & recycling
- Land use planning
- Transportation systems
- Green buildings
- Local agriculture
- Urban forestry
- Renewable Energy

Role of Public Health in Reducing Carbon Emissions

- Public Outreach & Education
  - Climate Change must be viewed in "human health" terms
  - Most Americans see global implications, but feel helpless
  - Our message:
    - Climate Change is affecting *local communities;*
    - *Problem cannot be solved without local actions*
    - Predictions dire but emissions & health impacts can be reduced

- Inform Decisions of Other Sectors
  - "Health" must be key consideration in policy decisions of land-use, transportation, and energy sectors
  - *"Health in All Polices* begins in the public health sector"

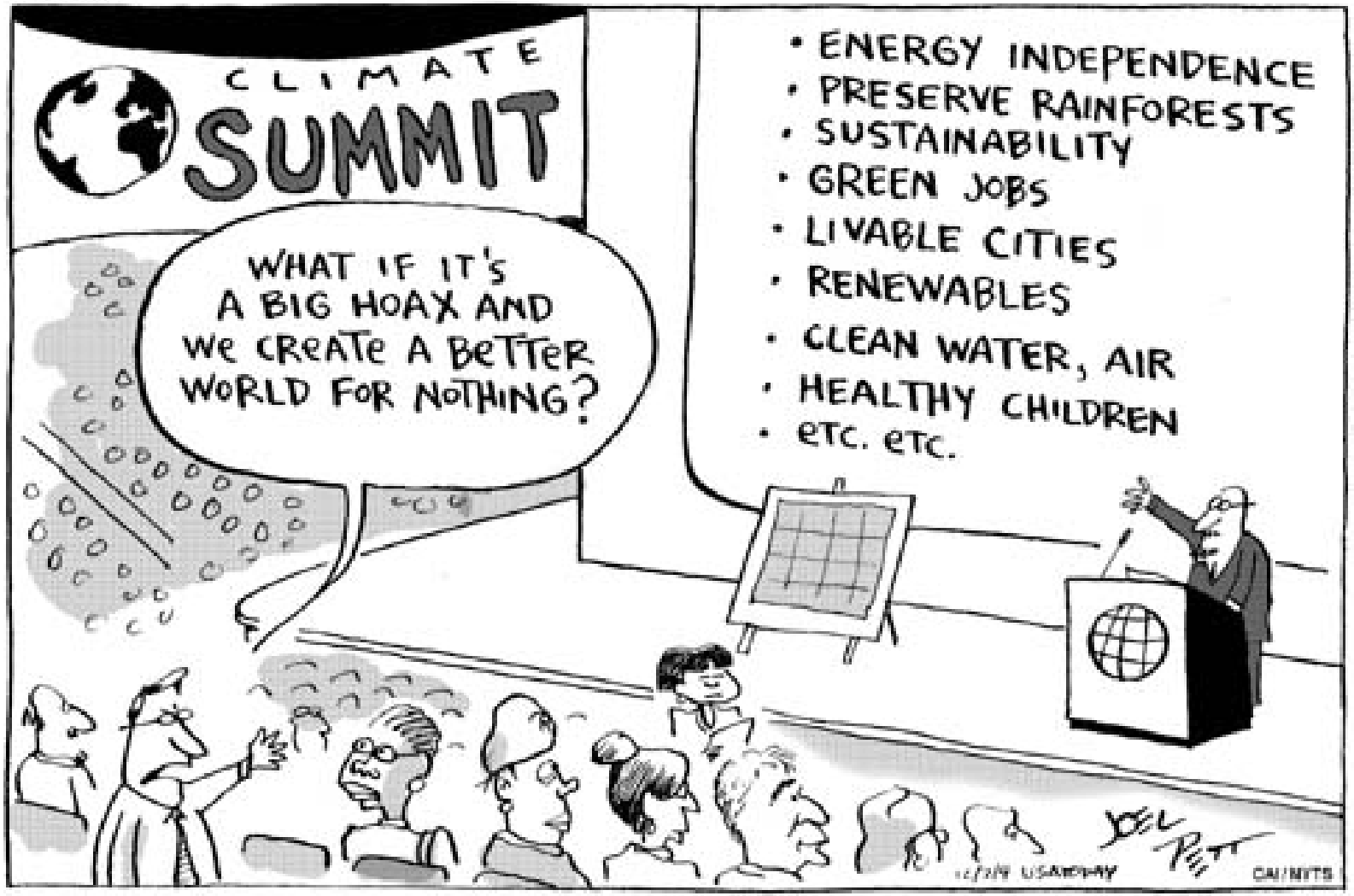
Role of Public Health Sector in Preparedness

- Assist local government in climate change preparedness including:
    - Identification of health impacts, and at-risk populations; and
    - Recommended actions to reduce health impacts and create climate-resilient communities
- Build Public Health capacity for surveillance and monitoring to improve climate preparedness and response

Climate Action Yields Multiple Benefits

- Strategies to reduce VMT (vehicle-miles-travelled) reduces carbon emissions and results in higher rates of physical activity
- Promoting cleaner energy production & cleaner fuels reduces carbon emissions, air pollution & respiratory disease
- Preparing for climate change improves preparedness for all hazards

JOEL PETT
USA TODAY



DPH Five Point Plan to Reduce Health Impacts of Climate Change

(*and Create Healthy, Sustainable and Resilient Communities*)

1. Inform the general public on the nature of climate change, its potential health effects, and actions they can take to reduce greenhouse gas emissions

2. Promote adoption of local policies that reduce carbon emissions and support the design of healthy and sustainable communities. (Focus on planning, land-use, transportation, water, and energy sectors)

3. Provide guidance to local government and community partners in climate change preparedness, including the identification of health impacts, at-risk populations, and actions to reduce impacts and create more climate-resilient communities

4. Build Departmental capacity for surveillance and monitoring to improve climate preparedness and response

5. Adopt best practices to reduce green house gas emissions associated with government-owned facilities and operations

Conclusion

- "Climate Change: A Catastrophe in Slow Motion" [1]
    - *"The long reach of our decisions gives us unprecedented power over the future; and with that comes unprecedented responsibility"* [1]
- We must: (1) prepare for the effects of climate change; (2) educate the public; and (3) advocate for urgent action to reduce carbon emissions
- Public support highly dependent on effective communications re health impacts, and "co-benefits" of climate action
- Local action vital to reducing CO^2 emissions and building healthy, sustainable and resilient communities

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[1] Pierrehumbert, R.T., *Climate Change: A Catastrophe in Slow Motion,* Chicago Journal of International Law, Volume 6, No. 2 (2006)

Final Words

- *"We now face a new and unprecedented change: Climate change. (It is) perhaps the greatest environmental health challenge for the remainder of our careers, and perhaps for all those (public health professionals) who will follow us."* (Howard Frumkin, MD, Dr.PH, Director, National Center for Environmental Health, CDC, 2006)